

## Use of Detector Dogs in Residue Management Programs

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The detection of organochlorine (OC) residues in beef exported to USA in 1987 prompted the banning of the use of OC's and a national recall of OC chemicals on farm. Meatworks monitoring has proved successful in detecting cattle with organochlorine residues, however, identifying the actual source of these residues on farm has proved more challenging.

The national NORM program (National Organochlorine Residue Management program) commenced in 1995. The program focus is on active management of OC broad acre and point source contamination at the farm level. To do this requires accurate and efficient identification of OC point sources that provide potential to produce cattle with OC residues above Australian MRL's.

In an effort to improve the efficiency of detecting OC contamination in the on-farm environment, the Queensland Department of Primary Industries and Fisheries (QDPI&F) has taken the initiative to develop and train a residue detection dog, Norm.

Norm is a world first in the area of residue detection and is trained to seek out a range of organochlorines in the soil, specifically dieldrin, aldrin, DDT and its breakdown products, DDD and DDE. His detection level is to 1ppm for each of the above odours, however, he is capable of detecting at much lower levels.

Norm's key detection ability lies in the identification of point sources of OC residue. Norm is an active response dog, which means when he detects an imprinted odour, he will dig actively at the site. Norm also displays Attitude Changes and Obvious Physical Reactions (OPR's) when he detects OC odour, and these indications are useful in mapping out the boundaries of contaminated areas.

Norm has been in training since 1997 and became fully field operational in July 1999.

The on-farm work has led to many learnings about the finer points of OC odour detection by dogs, including consideration of weather conditions, soil temperature and soil type.

Table I outlines Norm's initial field validation work on known sites.

	Site +	Site -	TOTAL
<b>Indicated positive</b>	84	19	<b>103</b>
<b>No indication</b>	7	5	<b>12</b>
<b>TOTAL</b>	<b>91</b>	<b>24</b>	<b>115</b>

Sensitivity 92.3% (86.8 – 97.7)

Specificity 20.8% (4.6 – 37.0)

PPV 81.6%

Table II shows Norm's field operational results from July 1 1999 to June 2000 on unknown sites.

	Site +	Site -	TOTAL
<b>Indicated positive</b>	97	9	<b>106</b>
<b>No indication</b>	1	1	<b>2</b>
<b>TOTAL</b>	<b>98</b>	<b>10</b>	<b>108</b>

Sensitivity 98.98% (96.9 – 100)

Specificity 10% (0 – 28.6)

PPV 91.5%

Residue detection dogs such as Norm provide an efficient tool to assist in the identification of sites contaminated with OC's, allowing their effective management as hazards in a risk management program

Norm offers advantages in savings in time and people resources, and reduced numbers of soil tests required to accurately pinpoint the contaminated site/s.

Following in Norm's success is Breeze, a purebred chocolate Labrador female. She completed her accreditation trials in July 2003 and is currently undergoing field validation work before assuming full operational duties as a detector dog within the DPI&F detector dog team.



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